

**What is Claimed is:**

1. A voltage controlled oscillator for controlling the oscillation frequency of an output signal depending on an input voltage, being characterized to receive a modulated voltage and output an FM signal having a band including a fundamental oscillation frequency and plural higher-order harmonic components of said fundamental oscillation frequency.

2. A voltage controlled oscillator in accordance with claim 1, wherein a frequency band including only the predetermined higher-order harmonic component is filtered at the output stage.

3. An FM signal optical transmitter comprising a signal processor for outputting an FM signal having a band including a fundamental oscillation frequency and plural higher-order harmonic components of said fundamental oscillation frequency, a band-pass filter for taking out only the predetermined-order harmonic signal component from said FM signal output from said signal processor, a frequency converter for shifting the taken-out harmonic signal component to the lower frequency side or the higher frequency side, and an electric/optic converter for converting the output signal of said frequency converter into an optical signal.

4. An FM signal optical transmitter comprising a signal processor for outputting an FM signal having a band including a fundamental oscillation frequency and plural higher-order harmonic components of said fundamental oscillation frequency,

a band-pass filter for taking out only the predetermined-order harmonic signal component from said FM signal output from said signal processor, a frequency multiplier that directly multiplies the taken-out harmonic signal component or shifts said harmonic signal component to the lower frequency side or the higher frequency side and then multiplies the shifted signal, and an electric/optic converter that directly converts the frequency-multiplied signal into an optical signal or shifts said frequency-multiplied signal to the lower frequency side or the higher frequency side and then converts the shifted signal into an optical signal, wherein

the modulation degree of said frequency-multiplied signal is raised to a predetermined modulation degree at the time of multiplication.

5. An FM signal optical transmitter in accordance with claim 3 or 4, wherein said signal processor for outputting said FM signal is a voltage controlled oscillator in accordance with claim 1 or 2, and said modulated voltage is formed of plural subcarrier-multiplexed signals.

6. An FM signal optical transmitter in accordance with claim 3, wherein a predetermined harmonic carrier wave component is extracted from some harmonic components at the output of said signal processor, and the extracted harmonic carrier wave component is used as a reference frequency source required when frequency conversion is carried by said frequency converter.

7. An FM signal optical transmitter in accordance with claim 4, wherein said frequency shifting is carried out by a frequency converter, a predetermined harmonic carrier wave component is extracted from some harmonic components at the output of said signal processor, and the extracted harmonic carrier wave component is used as a reference frequency source required when frequency conversion is carried by said frequency converter.

8. An FM signal optical receiver comprising an optic/electric converter that receives an optical signal transmitted from said FM signal optical transmitter in accordance with one of claims 3 to 7 and converts said optical signal into an electric signal, and an FM demodulator for demodulating an FM signal converted into said electric signal.

9. An FM signal optical transmission system comprising said FM signal optical transmitter in accordance with one of claims 3 to 7, an optic/electric converter that receives an optical signal transmitted from said FM signal optical transmitter and converts said optical signal into an electric signal, and an FM demodulator for demodulating an FM signal converted into said electric signal.